



CASE REPORT: SILICONE HYDROGEL MICROBIAL KERATITIS

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HISTORY AND SYMPTOMS

CONTACT LENS HISTORY AND CURRENT CORRECTION

PATIENT DEMOGRAPHICS
26 year old Female

CL HISTORY
Daily Disposable CL wear: 2 Years
Silicone Hydrogel Extended CL wear : 3 Years
No previous ocular adverse events

LENS WEAR AT TIME OF REPORTED KERATITIS
Extended Wear, Monthly Replacement
Easivision All Day All Night
Lotrafalon A
RE: 8.60/13.80 /-2.00D
LE: 8.60/13.80 /-2.25D

CURRENT MODE OF CORRECTION
Spectacles



ONSET OF SYMPTOMS

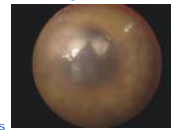
DAY 1 AM (01/12/03)
SYMPTOMS: RE painful, itchy, red with extreme photophobia and no vision loss

LENGTH OF CL WEAR: 3.5 weeks without removal
ACTION1: Consulted habitual optometrist and the following advice was given: "Remove CLs and do not sleep with CLs for 1 night"; **NO FOLLOW UP APPOINTMENT OR 24 HOUR EMERGENCY CONTACT NUMBER WERE GIVEN.**

DAY 2 AM (02/12/03)
SYMPTOMS: Sleepless night due to immense pain
ACTION1: Visited Optometrist local to patient home and was immediately referred to Mayday Eye Hospital.

ACTION2: Attended Mayday Eye Hospital where she was diagnosed with **PSEUDOMONAS AERUGINOSA (CULTURE POSITIVE) MICROBIAL KERATITIS** and treated with Ofloxacin and Gentamicin hourly. Advised to return the following morning.

DAY 3 AM (03/12/03)
Admitted as an in-patient until 05/12/03
Continued treatment with Ofloxacin and Gentamicin and followed by Predsol once the epithelium had healed.



Corneal scarring of affected eye at 4 months

Slit section of affected RE at 6 weeks

Day 1

Day 2: Hypopyon clearly visible

VISUAL PERFORMANCE

6 WEEKS

RE -3.75 / -0.75 x 35
LE -2.00 / -0.50 x 100

Subjective Refraction

COAS Refraction

RE Dia = 3mm -3.25/-1.00x36
LE -2.03/-0.93x98
Pupil Dia = 4mm Pupil -3.20/-1.25x28
Dia=7mm -2.02/-0.87x103
-2.80/-2.50x25 -1.71/-0.71x104

4 MONTHS

RE -3.00 / -1.00 x 30
LE -2.00 / -0.50 x 105

RE Dia = 3mm -2.64/-1.49X32
LE -2.31/-0.91X96
-2.51/-1.84X32 -2.23/-1.01X96
-2.77/-2.35X36 -1.81/-0.48X97

1.00D Myopic Increase compared to Pre-AE
1.00 - 1.50D Astigmatism Increase with pupil size: 3mm: ~ -1.00D / 7mm: ~ -2.50D

VISUAL PERFORMANCE

HC		LC		VA in VA Unit (1.0-11line)		HC		LC	
RE	LE	RE	LE			RE	LE	RE	LE
0.1	0.5	-2.6	-1.6	High Luminance		0.8	0.7	-2.1	-1.2
-1.2	-0.2	-3.5	-2.5	Medium Luminance		-0.2	0.4	-3.1	-2.0
-3.1	-2.0	-8.5	-7.0	Low Luminance		-1.9	-1.5	-7.0	-6.0

Very little loss of VA as measured in routine practice (HCHL 6W Loss:0.4line / 4M Gain 0.1line)
Significant functional loss: LC 1.0 to 1.5 lines loss at 6W & 4M

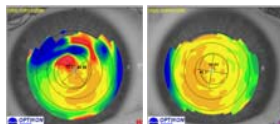
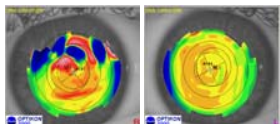
ABERRATIONS

6 WEEKS

CORNEAL ABERRATIONS

4 MONTHS

RMS Higher order		RMS Higher order					
RE	LE	Factor		RE	LE	Factor	
3mm	0.624	0.044	X14.2	3mm	0.395	0.043	X9.2
4mm	1.452	0.118	X12.3	4mm	0.886	0.117	X7.6
7mm	6.040	0.914	X6.6	7mm	3.150	0.902	X3.5



OCULAR ABERRATIONS

RMS Higher order		RMS Higher order					
RE	LE	Factor		RE	LE	Factor	
3mm	0.161	0.044	x3.6	3mm	0.117	0.060	x2.0
4mm	0.393	0.102	x3.8	4mm	0.356	0.100	x3.6
7mm	1.900	0.552	x3.4	7mm	1.752	0.783	x2.2

Corneal aberrations: LE normal, RE outside of normal range (RE= x3.5 to x9.2 LE at 4Months)

ABSTRACT

The case report relates to a contact lens wearing patient referred with a painful, photophobic red eye to Croydon Eye Hospital Casualty by a local optometrist. The report describes a case of pseudomonas aeruginosa ulcer with 30 day continuous wear silicone hydrogel, highlighting contributory factors to the severity of the event that lead to vision loss and permanent scarring.

The patient, a 26-year-old female, had successfully worn Easy Vision All Day All Night contact lenses for 3 years, changing her contact lenses monthly, and wearing them without removal on average of 30 days. She presented to her contact lens practitioner at midday complaining of pain, itchiness, redness and light sensitivity. Post examination, she was instructed not to wear contact lenses and was sent home. The following day the patient consulted an optometrist local to her home with increased lacrimation, redness, and pain, and was immediately referred.

She was diagnosed to have microbial keratitis and corneal scraping isolated pseudomonas aeruginosa. Aggressive treatment was immediate (Ofloxacin and Gentamicin hourly,) and included hospitalization. Examination one month post-event included videokeratography, LogMAR visual acuity, videokeratography, slit lamp photography and confocal microscopy. It revealed permanent VA loss, increased corneal aberrations, multiple deep corneal scarring within the pupillary area and endothelial cell loss.

The poster will describe in details this case history that confirms that despite full respect of the cornea oxygen physiological needs, silicone hydrogel can produce mechanical corneal damage that facilitates bacterial penetration and infection. The case highlights the need for rapid and correct diagnosis and the very grave consequences of delay in treatment.

INVESTIGATIONAL TECHNIQUES

VISION AND ABERRATION ASSESSMENT

- Autorefractometry / Autokeratometry
- Subjective Refraction
- Videokeratography
Corneal Aberrations
- Videokeratography
Ocular Aberrations
- Pupillometry
- Visual Performance



CONFOCAL MICROSCOPY

CONFOSCAN 2



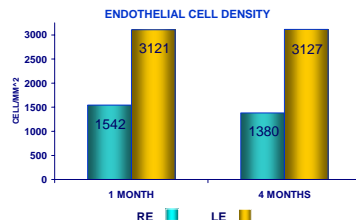
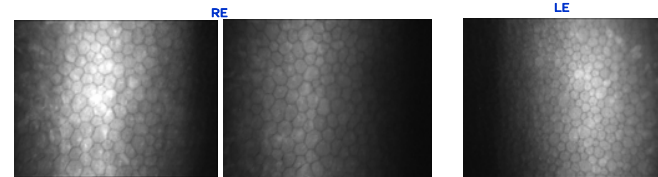
The Confoscan 2 allows the corneal tissue to be viewed at high magnification with an arrangement whereby one slit illuminates the corneal tissue and a second slit filters out the reflected light from the unfocused layers, thus allowing the cornea to be clearly viewed.

DISTANCE IMMERSION PRINCIPLE

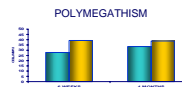


The space between the objective and the corneal surface is filled with Viscotears allowing the cornea to be viewed without direct contact

CONFOCAL MICROSCOPY - ENDOTHELIUM



RE at 6 weeks: +Endothelial cell density per mm² half of LE.
RE at 4 months: +Further decrease of 162 endothelial cells per mm².
LE: +Within normal limits.

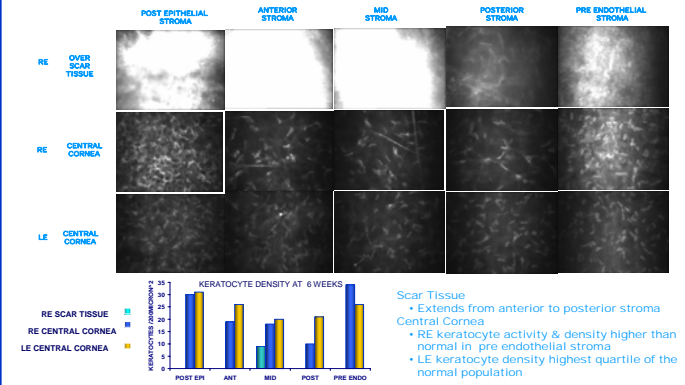


RE at 6 weeks and 4 months: +Decreased polymegathism in comparison to left eye

IK produced a 50% loss in endothelial cells (density typical of a 80 year old)
To our knowledge, this has not been previously reported in the literature

CONFOCAL MICROSCOPY - STROMA

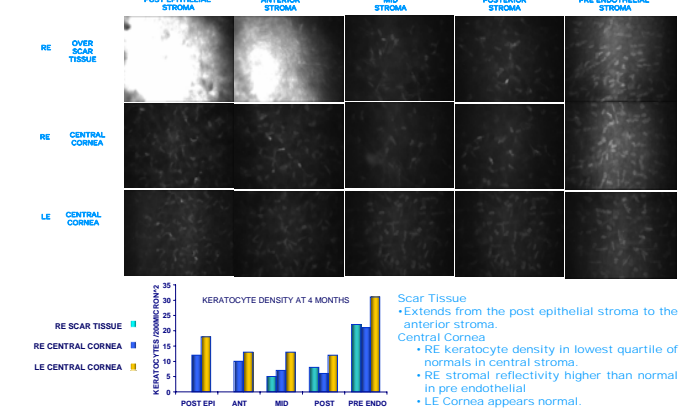
6 WEEKS



Scar Tissue
• Extends from anterior to posterior stroma
Central Cornea
• RE keratocyte activity & density higher than normal in pre endothelial stroma
• LE keratocyte density highest quartile of the normal population

Elevated stromal inflammatory activity not observable in clinical practise (Eye white and quiet)

4 MONTHS



Scar Tissue
• Extends from the post epithelial stroma to the anterior stroma.
Central Cornea
• RE keratocyte density in lowest quartile of normals in central stroma.
• RE stromal reflectivity higher than normal in pre endothelial
• LE Cornea appears normal.

Decrease in extent of visible scar
Permanent (?) decrease in keratocyte density

DISCUSSION

This case report highlights several important clinical points regarding the management and the true effects of contact lens Infective Keratitis (IK).

- IK even though rare with Dk silicone hydrogel indicates that high supply of oxygen is not sufficient to prevent this most serious contact lens related adverse event.
- The high elastomeric characteristics of the contact lens may have contributed to corneal mechanical damage creating a portal of entry for the organisms.
- The failure to recognise the severity of the problem, and to take immediate action most likely resulted in greater permanent corneal damage and visual loss
- Routine clinical assessment of patients post IK under estimate the extent of the permanent changes:
 - Snellen VA at 4 months was normal whereas true LogMar VA was 1.0 to 1.5 lines reduced
 - Corneal aberrations were 3 to 9 times higher than the fellow eye
 - Endothelial loss resulted in a endothelial cell density typical of an 80 year old.

CONCLUSION

- It is important that contact lens practitioners are able to promptly detect and effectively manage microbial keratitis to minimise corneal tissue involvement and visual acuity loss.
- Post IK evaluation should include a detailed examination of the cornea, including endothelial cell count especially if the patient considers returning to contact lens wear.
- Contact lens IK may have long term implications not previously anticipated (endothelial decompensation).